

Attorney Dkt. No. 15154-XX
Serial No. 09/902,802
Filed: July 12, 2001

originally filed, Applicants submit that the amendments to the claims do not add new matter within the meaning of 35 U.S.C. §132.

The specification is objected to for particular language in the Abstract. In addition, claims 1, 2, 4-6 and 8 stand rejected as being obvious over Bronicki in view of the Dow Chemical article.

1. Objection to the Specification

The Examiner objects to the specification for phraseology found in the Abstract of the Disclosure. In particular, the Examiner objects to the use of the words "comprises" and "the present invention."

RESPONSE

Applicants respectfully traverse this objection and request reconsideration and withdrawal thereof.

Applicants have amended the Abstract to replace the language objected to by the Examiner with more appropriate language, thus removing the basis for this objection.

Accordingly, Applicant respectfully submits that the amendments to the Abstract provide proper language thereto, and respectfully requests reconsideration and withdrawal of the objection to the specification based on the language in the

Abstract.

2. Rejection of Claims 1, 2, 4-6 and 8

Under 35 U.S.C. 103(a)

Claims 1, 2, 4-6 and 8 stand rejected under 35 U.S.C. 103(a) as being obvious over Bronicki (U.S. Patent No. 4,428,190) in view of the Dow Chemical Company 1983 article "Achieving Low pressure Cogeneration with DOWTHERM Heat Transfer Fluids" for the reasons set forth in the Office Action.

RESPONSE

Applicant respectfully traverses this rejection and requests reconsideration and withdrawal thereof.

The references of record, Bronicki and the Dow Chemical Company article, do not teach or suggest Applicants' inventive subject matter as a whole, as recited in the amended claims. Further, there is no teaching or suggestion in this reference which would lead the ordinary skilled artisan to modify the reference to derive the subject matter as defined in the amended claims.

The U.S. Supreme Court in *Graham v. John Deere Co.*, 148 U.S.P.Q. 459 (1966) held that non-obviousness was determined under § 103 by (1) determining the scope and content of the prior art;

(2) ascertaining the differences between the prior art and the claims at issue; (3) resolving the level of ordinary skill in the art; and, (4) inquiring as to any objective evidence of nonobviousness.

A. The present inventive subject matter

As amended, claim 1 is directed to a method for producing power from a heat source. The first step of the method includes heating a synthetic, alkylated aromatic heat transfer fluid with heat from the heat source and producing a vaporized synthetic, alkylated aromatic heat transfer fluid in an intermediate fluid heater/vaporizer. The vaporized synthetic, alkylated aromatic heat transfer fluid is supplied to an organic fluid vaporizer for supplying heat to organic liquid working fluid present in the organic fluid vaporizer. The method further includes the steps of vaporizing the organic liquid working fluid with heat from the vaporized synthetic, alkylated aromatic heat transfer fluid in the organic fluid vaporizer to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in the organic fluid vaporizer and expanding the vaporized organic working fluid in an organic vapor turbine for generating power and producing an expanded vaporized organic working fluid. The

expanded organic vaporized working fluid is condensed to produce an organic fluid condensate, which is then supplied to the organic fluid vaporizer.

Likewise, amended claim 5 is directed to an apparatus for producing power from a heat source. The apparatus comprises: a) a synthetic, alkylated aromatic heat transfer fluid heater/vaporizer that heats and vaporizes the synthetic, alkylated aromatic heat transfer fluid with heat from the heat source and produces a vaporized synthetic, alkylated aromatic heat transfer fluid; b) an organic fluid vaporizer that receives the vaporized synthetic, alkylated aromatic heat transfer fluid for supplying heat to an organic liquid working fluid present in said organic fluid vaporizer and vaporizes said organic liquid working fluid with heat from said vaporized synthetic, alkylated aromatic heat transfer fluid to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in the organic fluid vaporizer; c) an organic vapor turbine that expands the vaporized organic working fluid and generates power and produces expanded vaporized organic working fluid; d) an organic fluid condenser that condenses the expanded organic vaporized working fluid to produce an organic working fluid condensate so that the organic working fluid condensate is supplied to the organic working fluid vaporizer.

B. The References

As has been stated in the previous response, Bronicki (U.S. Patent No. 4,428,190) discloses a power plant utilizing multi-stage turbines. In addition, when the load on the power plant decreases below rated value, the boiler operation is maintained, but low-grade exhaust steam exiting the high pressure turbine is diverted to a **heat store** large enough to accumulate heat. The **heat store** then supplies heat to the waste heat converter.

The Dow Chemical Company article discloses the use of heat transfer fluids in cogeneration operations.

C. Differences between claimed invention and references

The differences between applicant's inventive subject matter and the cited references are readily apparent from their independent and distinct disclosures and claims. As can be seen by the amended claims, the present inventive subject matter includes the limitation that the vaporized synthetic, alkylated heat transfer fluid is supplied to an organic fluid vaporizer **for supplying heat to the organic liquid working fluid present in the vaporizer.** The claims also now specify that **a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate are formed in the organic fluid vaporizer.**

Applicants respectfully submit that **the combination of references does not teach, nor suggest**, these limitations and thus the claims are not obvious over the combination of references.

Applicants respectfully submit that Bronicki discloses a power plant utilizing multi-stage turbines in which, when the load on the power plant decreases below rated value, the boiler operation is maintained, but low-grade exhaust steam exiting the high pressure turbine is diverted to **a heat store** large enough to accumulate heat. The **heat store** then supplies heat to the waste heat converter. Bronicki discloses that the heat store may be a large volume of water. In other words, Bronicki discloses that heat contained in hot water stored in store 22 is used to vaporize organic fluid liquid present in evaporator 27 of the waste heat converter 12.

However, Applicants submit that Bronicki does **not** teach the limitation of supplying the vaporized synthetic, alkylated aromatic heat transfer fluid to the organic fluid vaporizer for providing heat to the organic liquid working fluid present in the vaporizer. Nor does Bronicki teach forming a vaporized organic working fluid and a synthetic, alkylated aromatic fluid condensate in the vaporizer.

Further, these limitations are also **not** taught by the Dow

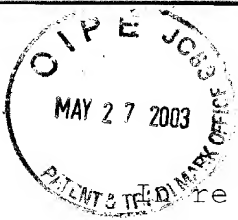
Chemical article. In fact, there is **no** disclosure in the Dow Chemical article regarding the use of an organic working fluid power cycle unit for extracting heat from a synthetic, alkylated aromatic heat transfer fluid. The use of an organic fluid rather than steam is advantageous in the present claims since, at low temperatures, more effective use of the heat contained in the heat source can be made. These advantages are not discussed or disclosed in the combination of references. Since the combination of references fails to disclose the claimed invention, Applicants respectfully submit that the Examiner has failed to make a *prima facie* case of obviousness regarding the claims.

Accordingly, Applicants respectfully submit that claims 1, 2, 4-6 and 8 are not obvious over the combination of references, and respectfully request reconsideration and withdrawal of the rejections.

CONCLUSION

In view of the foregoing, applicants respectfully request the Examiner to reconsider and withdraw the all pending rejections, and to allow all of the claims pending in this application.

If the Examiner has any questions or comments regarding this matter, he is welcomed to contact the undersigned attorney at the below-listed number and address.



re Application of:

O. ZIMRON et al.

Serial No.: 09/908,802

Group Art Unit: 2832

Filed: July 12, 2001

Examiner: J. Waks

For: **METHOD OF AND APPARATUS FOR PRODUCING POWER FROM A
HEAT SOURCE**

ATTACHMENT A - MARKED-UP COPY OF SPECIFICATION AMENDMENTS

Please amend the Abstract as follows:

A method for producing power from a heat source [comprises] includes the steps of: heating an intermediate fluid with heat from the heat source and producing a vaporized intermediate fluid in an intermediate fluid heater/vaporizer. Heat from the vaporized intermediate fluid vaporizes an organic liquid working fluid present in an organic working fluid vaporizer to form a vaporized organic working fluid and intermediate fluid condensate. The vaporized organic working fluid is expanded in an organic vapor turbine for generating power and producing expanded vaporized organic working fluid; the expanded organic vaporized working fluid being condensed to produce an organic fluid condensate with the organic fluid condensate being supplied to the organic fluid vaporizer. [According to the present invention, prior] Prior to supplying the vaporized intermediate fluid to the organic fluid vaporizer, the vaporized intermediate fluid is expanded in an intermediate fluid vapor turbine and power is produced.

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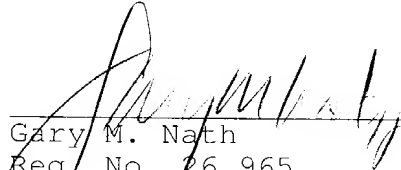
Respectfully submitted,

NATH & ASSOCIATES

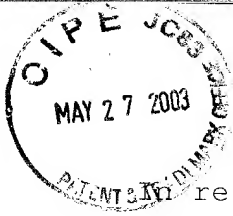
Date: May 27, 2003

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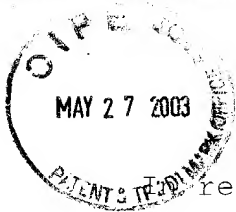
Examiner: J. Waks

For: **METHOD OF AND APPARATUS FOR PRODUCING POWER FROM A
HEAT SOURCE**

ATTACHMENT B - CLEAN COPY OF SPECIFICATION AMENDMENTS

Please amend the Abstract as follows:

A method for producing power from a heat source includes the steps of: heating an intermediate fluid with heat from the heat source and producing a vaporized intermediate fluid in an intermediate fluid heater/vaporizer. Heat from the vaporized intermediate fluid vaporizes an organic liquid working fluid present in an organic working fluid vaporizer to form a vaporized organic working fluid and intermediate fluid condensate. The vaporized organic working fluid is expanded in an organic vapor turbine for generating power and producing expanded vaporized organic working fluid; the expanded organic vaporized working fluid being condensed to produce an organic fluid condensate with the organic fluid condensate being supplied to the organic fluid vaporizer. Prior to supplying the vaporized intermediate fluid to the organic fluid vaporizer, the vaporized intermediate fluid is expanded in an intermediate fluid vapor turbine and power is produced.



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For: **METHOD OF AND APPARATUS FOR PRODUCING POWER FROM A
HEAT SOURCE**

ATTACHMENT C - MARKED-UP COPY OF CLAIM AMENDMENTS

Please amend claims 1 and 5 as follows:

1. (Twice Amended) A method for producing power from a heat source comprising the steps of:

a) heating a synthetic, alkylated aromatic heat transfer fluid with heat from said heat source and producing a vaporized synthetic, alkylated aromatic heat transfer fluid in an intermediate fluid heater/vaporizer;

b) supplying said vaporized synthetic, alkylated aromatic heat transfer fluid to an organic fluid vaporizer for supplying heat to organic liquid working fluid present in said organic fluid vaporizer;

c) vaporizing [an] said organic liquid working fluid with heat from the vaporized synthetic, alkylated aromatic heat transfer fluid in [an] said organic fluid vaporizer to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in said organic fluid vaporizer;

[c)] d expanding said vaporized organic working fluid

in an organic vapor turbine for generating power and producing an expanded vaporized organic working fluid;

[d)] e) condensing said expanded organic vaporized working fluid to produce an organic fluid condensate; and

[e)] f) supplying the organic fluid condensate to the organic fluid vaporizer.

5. (Twice Amended) Apparatus for producing power from a heat source comprising:

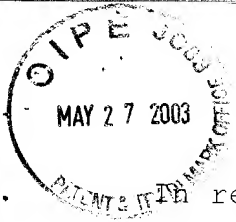
a) a synthetic, alkylated aromatic heat transfer fluid heater/vaporizer that heats and vaporizes the synthetic, alkylated aromatic heat transfer fluid with heat from said heat source and produces a vaporized synthetic, alkylated aromatic heat transfer fluid;

b) an organic fluid vaporizer that receives said vaporized synthetic, alkylated aromatic heat transfer fluid for supplying heat to an organic liquid working fluid present in said organic fluid vaporizer and vaporizes [an] said organic liquid working fluid with heat from [the] said vaporized synthetic, alkylated aromatic heat transfer fluid to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in said organic fluid vaporizer;

c) an organic vapor turbine that expands said vaporized organic working fluid and generates power and produces expanded vaporized organic working fluid;

d) an organic fluid condenser that condenses said

expanded organic vaporized working fluid to produce an organic working fluid condensate so that the organic working fluid condensate is supplied to the organic working fluid vaporizer.



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HEAT SOURCE**

ATTACHMENT D - CLEAN COPY OF CLAIM AMENDMENTS

Please amend claims 1 and 5 as follows:

1. (Twice Amended) A method for producing power from a heat source comprising the steps of:

a) heating a synthetic, alkylated aromatic heat transfer fluid with heat from said heat source and producing a vaporized synthetic, alkylated aromatic heat transfer fluid in an intermediate fluid heater/vaporizer;

b) supplying said vaporized synthetic, alkylated aromatic heat transfer fluid to an organic fluid vaporizer for supplying heat to organic liquid working fluid present in said organic fluid vaporizer;

c) vaporizing said organic liquid working fluid with heat from the vaporized synthetic, alkylated aromatic heat transfer fluid in said organic fluid vaporizer to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in said organic fluid vaporizer;

d) expanding said vaporized organic working fluid in an

organic vapor turbine for generating power and producing an expanded vaporized organic working fluid;

e) condensing said expanded organic vaporized working fluid to produce an organic fluid condensate; and

f) supplying the organic fluid condensate to the organic fluid vaporizer.

5. (Twice Amended) Apparatus for producing power from a heat source comprising:

a) a synthetic, alkylated aromatic heat transfer fluid heater/vaporizer that heats and vaporizes the synthetic, alkylated aromatic heat transfer fluid with heat from said heat source and produces a vaporized synthetic, alkylated aromatic heat transfer fluid;

b) an organic fluid vaporizer that receives said vaporized synthetic, alkylated aromatic heat transfer fluid for supplying heat to an organic liquid working fluid present in said organic fluid vaporizer and vaporizes said organic liquid working fluid with heat from said vaporized synthetic, alkylated aromatic heat transfer fluid to form a vaporized organic working fluid and a synthetic, alkylated aromatic heat transfer fluid condensate in said organic fluid vaporizer;

c) an organic vapor turbine that expands said vaporized organic working fluid and generates power and produces expanded vaporized organic working fluid;

d) an organic fluid condenser that condenses said

expanded organic vaporized working fluid to produce an organic working fluid condensate so that the organic working fluid condensate is supplied to the organic working fluid vaporizer.